

Chapter 12

Probability

12.1 Permutations and Combinations

Permutations: ${}^n P_m$

Combinations: ${}^n C_m$

Whole numbers: n, m

1251. Factorial

$$n! = 1 \cdot 2 \cdot 3 \dots (n-2)(n-1)n$$

$$0! = 1$$

1252. ${}^n P_n = n!$

$$\mathbf{1253.} \quad {}^n P_m = \frac{n!}{(n-m)!}$$

1254. Binomial Coefficient

$${}^n C_m = \binom{n}{m} = \frac{n!}{m!(n-m)!}$$

1255. ${}^n C_m = {}^n C_{n-m}$

1256. ${}^n C_m + {}^n C_{m+1} = {}^{n+1} C_{m+1}$

$$1257. {}^n C_0 + {}^n C_1 + {}^n C_2 + \dots + {}^n C_n = 2^n$$

1258. Pascal's Triangle

Row 0					1					
Row 1				1		1				
Row 2			1		2		1			
Row 3		1		3		3		1		
Row 4		1	1	4		6		4	1	
Row 5	1		5	10		10		5	1	
Row 6	1	1	6	15		20		15	6	1